Upgrading Routers to BayRS Version 13.*xx*

BayRS Version 13.00
Site Manager Software Version 7.00
BCC Version 4.05

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Bay Networks *Where Information Flows.*™

Bay Networks Where Information Flows™

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Preface

This guide describes how to upgrade Bay Networks® router software from BayRS™ Versions 11.*xx* and 12.*xx* to Version 13.*xx*.

Before You Begin

Before using this guide, make sure that the router you plan to upgrade is currently running BayRS Version 11.*xx* or 12.*xx* and that it meets BayRS 13.*xx* hardware and free-space requirements (see "Router Upgrade Prerequisites" on page 2-4). If you need help meeting prerequisites, contact the Bay Networks Technical Solutions Center in your area.

Text Conventions

This guide uses the following text conventions:

angle brackets (< >)	Indicate that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command. Example: If the command syntax is: **ping** *<ip_address>*, you enter: **ping 192.32.10.12**
bold text	Indicates text that you need to enter and command names and options. Example: Enter **show ip** {**alerts** | **routes**} Example: Use the **dinfo** command.

braces ({})	Indicate required elements in syntax descriptions where there is more than one option. You must choose only one of the options. Do not type the braces when entering the command. Example: If the command syntax is: **show ip** {**alerts** | **routes**}, you must enter either: **show ip alerts** or **show ip routes**.
brackets ([ ])	Indicate optional elements in syntax descriptions. Do not type the brackets when entering the command. Example: If the command syntax is: **show ip interfaces** [**-alerts**], you can enter either: **show ip interfaces** or **show ip interfaces -alerts**.
italic text	Indicates file and directory names, new terms, book titles, and variables in command syntax descriptions. Where a variable is two or more words, the words are connected by an underscore. Example: If the command syntax is: **show at** <*valid_route*> *valid_route* is one variable and you substitute one value for it.
`screen text`	Indicates system output, for example, prompts and system messages. Example: `Set Bay Networks Trap Monitor Filters`
separator (>)	Shows menu paths. Example: Protocols > IP identifies the IP option on the Protocols menu.
vertical line (|)	Separates choices for command keywords and arguments. Enter only one of the choices. Do not type the vertical line when entering the command. Example: If the command syntax is: **show ip** {**alerts** | **routes**}, you enter either: **show ip alerts** or **show ip routes**, but not both.

Acronyms

BootP	Bootstrap Protocol
CPU	central processing unit
DCE	data circuit-terminating equipment
DCM	data collection module
FTP	File Transfer Protocol
GUI	graphical user interface
HDLC	High-level Data Link Control
HSSI	High Speed Serial Interface
IP	Internet Protocol
IPX	Internetwork Packet Exchange
LAN	local area network
MAC	media access control
MIB	management information base
PROM	programmable read-only memory
RAM	random access memory
RIP	Routing Information Protocol
RMON	remote monitoring
SIMM	single inline memory module
SNMP	Simple Network Management Protocol
TFTP	Trivial File Transfer Protocol

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- The “CD ROMs” section lists available CDs.
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- The “Technical Manuals” section lists available printed documentation sets.

Make a note of the part numbers and prices of the items that you want to order. Use the “Marketing Collateral Catalog description” link to place an order and to print the order form.

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http://www.baynetworks.com/corporate/contacts/

Or telephone the Bay Networks Technical Solutions Center at:

800-2LANWAN

Chapter 1
Router Upgrade Overview

This chapter describes the router upgrade process and provides a checklist that you should carefully review before you begin the router upgrade process. Refer to the following topics:

Topic	Page
Router Upgrade Process	1-2
Router Upgrade Checklist	1-2

The router upgrade process applies to the following Bay Networks routers:

- Access Node (AN®)
- Access Node Hub (ANH™)
- BayStack™ AN
- BayStack ANH
- BayStack Advanced Remote Node™ (ARN™)
- Access Stack Node (ASN™)
- Backbone Concentrator Node (BCN®)
- Backbone Link Node (BLN®)
- System 5000™

Note: If you are upgrading an AN, ANH, ARN, or ASN router, read *Configuring BayStack Remote Access* or *Connecting ASN Routers to a Network* before you begin the upgrade process. These guides explain the special considerations for configuring and booting these routers.

Router Upgrade Process

The process for upgrading routers to BayRS Version 13.*xx* consists of four major phases and one optional task:

1. Preparing to upgrade (see Chapter 2)
2. Starting the upgrade: upgrading to Site Manager Version 7.*xx* and BayRS Version 13.*xx* (see Chapter 3)
3. Continuing the upgrade: transferring the customized image files and associated router files to the router and upgrading PROMs (see Chapter 4)
4. Completing the upgrade: booting the router with the customized image and upgrading the configuration (see Chapter 5)

You may also need to upgrade the DCM software image in BayStack routers (see Appendix B).

Router Upgrade Checklist

Review the following items before you begin the router upgrade process:

1. **Check your hardware requirements, the amount of contiguous free space on your flash volume, and the version of your boot PROM.**

   See "Router Upgrade Prerequisites" on page 2-4.

2. **Identify the version of router software you are currently running.**

   If you plan to run RMON or RMON2 on a BayStack router (AN, ANH, or ARN), you must first upgrade the DCM software image. For instructions on upgrading the DCM software image, see Appendix B.

3. **Identify the hardware configuration of the router you want to upgrade (router model, link modules, and slot assignments for link modules).**

4. **Gather the manuals you will need to refer to during the router upgrade process (Table 1-1). These manuals provide detailed information about many of the concepts and procedures outlined in this manual.**

Table 1-1. Reference Books for Upgrading Routers

To Do This	Refer to This Book
Upgrade Site Manager on a PC or UNIX workstation.	*Quick-Starting Routers*
Customize the router software image.	*Configuring and Managing Routers with Site Manager*
Back up the router software image and configuration files.	*Configuring and Managing Routers with Site Manager*
Transfer your customized image and router files to the router.	*Configuring and Managing Routers with Site Manager*
Upgrade boot or diagnostic PROMs in a router.	*Using Technician Interface Software*
Boot the router with a customized image.	*Configuring and Managing Routers with Site Manager*
Upgrade configuration files on the router.	*Configuring and Managing Routers with Site Manager*

Chapter 2
Preparing to Upgrade

This chapter describes Site Manager and router prerequisites that you must meet before starting the router upgrade process. See the following topics:

Topic	Page
Inspecting the Upgrade Kit	2-1
Site Manager Upgrade Prerequisites	2-2
Router Upgrade Prerequisites	2-4

Inspecting the Upgrade Kit

Check your upgrade kit to ensure that it contains the following BayRS Version 13.*xx* and Site Manager Version 7.*xx* components:

- CD containing BayRS and Site Manager software
- CD containing the online documentation library
- Printed versions of the following guides
  - -- BayRS Release Notes and Site Manager Release Notes
  - -- Read Me First (if applicable)
  - -- Task Map
  - -- Release Strategy
  - -- BCC Quick Reference Card
  - -- Known Anomalies
  - -- Document Change Notice (DCN) (if applicable)

Site Manager Upgrade Prerequisites

Before you upgrade to Site Manager Version 7.*xx*, review Site Manager system requirements and if necessary, update TCP/IP, network adapters, and drivers on the PC.

Reviewing Site Manager System Requirements

Site Manager is a graphical user interface (GUI) for router configuration and management over an IP network. To run Site Manager Version 7.*xx*, your PC, IBM workstation, SPARCstation, or HP 9000 must meet the hardware and software requirements listed in Table 2-1.

Table 2-1. Site Manager System Requirements

Platform	Hardware and Software Requirements
PC	• 486 PC (Pentium recommended) • Microsoft Windows® 95 or Windows NT® Version 4.0 • 16 MB of RAM (minimum) • 60 MB of free disk space • Microsoft TCP/IP protocol and compatible network adapters and driver • CD-ROM drive • VGA monitor (SuperVGA monitor recommended)
IBM workstation	• Supported workstations: RS/6000 340, 370 and PowerPC • Supported operating system: IBM AIX Version 4.2 • Window environments: CDE 1.0.1 and AIX Motif 1.2 • 32 MB of RAM (64 MB recommended) • 95 MB of disk space • 32 MB of swap space (64 MB recommended; use 96 MB of swap space with the NetView for AIX application) • Network adapter appropriate for your network • CD-ROM drive

(continued)

Table 2-1. Site Manager System Requirements *(continued)*

Platform	Hardware and Software Requirements
SPARCstation	• Supported workstations: SPARCstation 10, 20 and UltraSPARCstation • Supported operating systems: SunOS 4.1.4 and Solaris 2.5.1 and 2.6 • Window environments for Solaris: CDE 1.0.1 and OpenWindows 3.5 • 32 MB of RAM (64 MB recommended) • 100 MB of disk space • 32 MB of swap space • Network adapter appropriate for your network • CD-ROM drive
HP 9000	• Supported workstations: HP 9000 Series 700 and 800 • Supported operating system: HP-UX 10.20, including the complete network services directory • Window environment: CDE 1.0.1 • 32 MB of RAM • 95 MB of free disk space • 32 MB of swap space (64 MB recommended) • Network adapter appropriate for your network • CD-ROM drive

Updating TCP/IP, Network Adapters, and Drivers for Windows 95

Site Manager Version 7.*xx* for Windows 95 requires the Microsoft TCP/IP protocol stack provided with Windows 95 and a compatible network adapter and driver.

If you purchased a PC with Windows 95 and a network adapter installed, most likely you have the correct TCP/IP protocol stack, network adapter, and driver.

If you need to upgrade from Windows 3.1 to Windows 95, first uninstall any existing 16-bit TCP/IP stack, such as Distinct TCP/IP Run Time. Otherwise, Windows 95 will install that stack instead of the Microsoft TCP/IP protocol stack.

If you already upgraded from Windows 3.1 to Windows 95 and the upgrade kept an existing 16-bit TCP/IP stack, such as Distinct TCP/IP Run Time, you must uninstall the 16-bit TCP/IP stack before adding the Microsoft TCP/IP protocol stack.

To uninstall a 16-bit TCP/IP stack, refer to the TCP/IP provider's documentation and support for help in removing the stack's path statements, services file, and WINSOCK.DLL files dated prior to July 11, 1995 (the date of the WINSOCK.DLL file installed by Windows 95).

To add or update a protocol, network adapter, or driver, refer to the appropriate documentation and support from Microsoft and the adapter manufacturer. Protocols and driver updates are added from the Network option of the Control Panel. New network adapters and their drivers are added from the Add New Hardware option of the Control Panel.

Windows 95 attempts to match a driver to the network adapter installed on your PC. If Windows 95 cannot match a compatible driver, you need to update the drivers. Contact the adapter manufacturer for the latest drivers. Microsoft and other Windows 95 Web sites may also have updated drivers.

See the *Microsoft Windows 95 Resource Kit* for additional technical information about these issues. A hard copy is available from Microsoft Press.

Router Upgrade Prerequisites

Do not begin the router upgrade process until you verify that the router you want to upgrade meets the prerequisites described in this chapter.

Note: If you need help meeting the hardware prerequisites of the Version 13.*xx* router software upgrade procedure, contact the Bay Networks Technical Solutions Center in your area.

Verifying Minimum Startup Requirements

Before you upgrade to BayRS Version 13.*xx*, perform the following steps to ensure that your router meets all minimum hardware configuration and revision level requirements:

- Identify the hardware configuration of the router you want to upgrade (router model, link modules, and slot assignments for link modules).
- Consider minimum hardware revisions (for example, a link module with hot-swap capability may require a hardware revision for Version 13.*xx*).
- Determine whether any other new router hardware depends on software or PROM upgrades to work properly.
- Obtain an 8 MB or 16 MB flash card (depending on your router type) on which to store the Version 13.*xx* router software image and associated files. A 4 MB flash card will not accommodate the BayRS Version 13.*xx* files.
- Ensure that you have adequate flash memory to accommodate the Version 13.*xx* router software. For instructions on how to check flash memory, see "Verifying Contiguous Free Space on a Flash Volume" on page 2-6.

  You must also complete any flash memory upgrades on your router. This procedure may include a boot PROM upgrade for the processor module in which your flash card resides. For example, if you have a BN router, you upgrade your flash card in each of the FRE® or FRE-2 processor modules.
- Consider your memory requirements carefully. Depending on the number of protocols installed on your router, you may require additional memory to run these protocols. If you have questions regarding memory requirements, contact the Bay Networks Technical Solutions Center in your area.
- Identify the version of router software that you are currently running. You should be running BayRS Version 11.*xx* or 12.*xx*.
- If you plan to run RMON or RMON2 on a BayStack router, you must first upgrade the DCM software image to Version 2.00.1; earlier versions do not work with BayRS Version 13.*xx*.
- Read these Bay Networks publications:
  - -- *Release Notes for BayRS Version 13.xx*
  - -- *Release Notes for Site Manager Software Version 7.xx*
  - -- *Known Anomalies: BayRS 13.xx and Site Manager 7.xx*

Verifying Contiguous Free Space on a Flash Volume

You must determine the amount of contiguous free space required on a flash card to accommodate your customized Version 13.*xx* router software image and configuration files. The amount of contiguous free space available on the target flash volume must be greater than the combined size of your customized Version 13.*xx* image and associated files (such as *config*, *ti.cfg*, *install.bat*, and, if appropriate, a Version 13.*xx* PROM image).

To verify the amount of contiguous free space available on a selected volume, see the fields at the bottom of the Site Manager Router Files Manager window (Table 2-2).

Table 2-2. Determining Contiguous Free Space on a Flash Card

Field	Meaning
Total SIze	Total number of bytes (used and unused) on the volume.
Available Free Space	Number of unused bytes on the volume.
Contiguous Free Space	Number of unused bytes in the largest block available on the volume. This space is actual usable memory.

Compacting a Flash Memory Card

Before upgrading the router, you should compact a flash memory card to ensure that the flash card has enough contiguous free space to accommodate the new Version 13.*xx* software image.

Compact your flash card during off-peak hours, if possible, because of the heavy resources required (FRE memory and CPU cycles). Do not remove a flash card, hot-swap a slot, or reset a slot during flash card compaction, because the card will become corrupted, causing loss of data.

Note: A flash compaction operation may take up to 12 minutes on an AN router. Do not turn the AN router on and off during compaction or you will corrupt the flash card and the AN router will not boot.

Compacting a Flash Memory Card Using Site Manager

Use the Router Files Manager Compact option to copy the active files from the flash memory card to router memory, erase the flash memory card, and copy the files back to the memory card.

To compact the flash memory card:

1. **In the main Site Manager window, choose Tools > Router Files Manager.**

   The Router Files Manager window opens.

2. **Select the volume that contains the flash memory media you want to compact.**

3. **Choose Commands > Compact.**

   A confirmation window appears.

4. **Click on OK.**

Compacting a Flash Memory Card Using the Technician Interface

To compact a flash memory card from the Technician Interface, enter the **compact** *<volume>*: command. For example, to compact the files in volume 2, enter:

compact 2:

The file system copies all the files to memory except for the deleted ones, erases the memory card, and copies the files back to the memory card.

Verifying the Current PROM Version

You can use Site Manager or the Technician Interface to determine the current version of boot and diagnostic PROM images currently running in your router.

See Appendix A for the following PROM information:

- List of the current boot and diagnostic PROM file names and associated revision numbers for each router platform
- Instructions on how to verify the current PROM version on your router

See “Task 3: Upgrading and Verifying PROMs on the Router” on page 4-9 for instructions on how to upgrade boot and diagnostic PROMs.

Using the BCC Help File

The Bay Command Console (BCC™) includes a new file called *bcc.help* in the router upgrade media for BayRS Version 13.*xx*. The file ships on the same flash card as the router boot image, as well as in the *rel* directory of the upgrade CD. The file is included in all router software suites.

To use BCC online Help, you must transfer the *bcc.help* file onto the router's flash card. For instructions on transferring files to the router's flash card, see "Task 2: Transferring the Customized Image and Router Files to the Router" on page 4-5.

The file is called *bcc.help* by default. You can specify a new path name for this Help file and then save this change to your existing configuration file as follows:

```
$ bcc
bcc> config
box# help-file-name <slot_number>:<file_name.help>
box# save config <config_filename>
```

slot_number is the slot number on which you want to store the Help file.

file_name.help is the Help file name (for example, *bcc.help*).

config_filename is the router configuration file name.

Backing Up Configuration Files on the Site Manager Workstation

Store backup copies of the configuration files on the Site Manager workstation. You should record the location, name, and purpose of each configuration file you back up.

Caution: Before deleting a configuration or log file, create a backup copy of the file. Also, back up the current log file on the Site Manager workstation before clearing it; you may want to refer to it later to troubleshoot a problem.

Modifying Configuration Files

A configuration file contains the user-defined configuration for a router and its interfaces. After you have a working configuration file, you can use that file to boot the router.

Bay Networks recommends that you always have a *config* file that you know works and that you test any new or modified configuration file under a unique name, for example, *test.cfg*. In this way, if the router has a problem starting, you can reset it and it will restart with the default file, *config* (see *Configuring and Managing Routers with Site Manager* for instructions about resetting the router).

Before you modify a configuration file, make sure that the router's destination volume has enough space available for the file. If there is not enough space, you will need to copy the original files to another system and delete them from the router (see *Configuring and Managing Routers with Site Manager* for instructions).

Chapter 3
Upgrading Site Manager and Router Software

This chapter describes how to upgrade to Site Manager Version 7.*xx* and BayRS Version 13.*xx*. It also describes how to customize the router software image and back up a router software image and configuration files. See the following topics:

Topic	Page
Task 1: Upgrading to Site Manager Version 7.xx	3-2
Task 2: Upgrading to BayRS Version 13.xx	3-6
Task 3: Customizing the Router Software Image	3-9
Task 4: Backing Up the Router Software Image and Configuration Files	3-13

Task 1: Upgrading to Site Manager Version 7.xx

This section describes how to upgrade Site Manager to Version 7.*xx* on your PC or UNIX workstation.

Note: You cannot use Quick2Config to configure AN, ANH, and ASN routers, because Quick2Config is no longer supported in BayRS Version 13.*xx*.

Upgrading Site Manager on a PC

To upgrade Site Manager on a PC running Windows 95 or Windows NT:

1. **Make sure that your PC complies with the Site Manager Version 7.*xx* system requirements listed in Table 2-1 on page 2-2.**
2. **Delete the existing Site Manager state files.**

   Site Manager creates state files for all Site Manager tools you use. State files describe the state of the application when you last exited it. You must delete these files before you install the new version of Site Manager on your PC or Site Manager may not function properly when you restart it.

   To delete the existing Site Manager state files, enter the following command in the Run window:

   del c:\wfl*.sts
3. **Load the Site Manager software.**

   Site Manager software is distributed on CD. Refer to the appropriate chapter in *Quick-Starting Routers* for instructions on loading Site Manager Version 7.*xx* from a CD onto a PC.
4. **Start Site Manager.**

   To start Site Manager using Windows 95 or Window NT:

   a. **From the Windows desktop, click on the Start button.**

   b. **From the Start menu, choose Programs > Site Manager > PC_Site Manager.**

The main Site Manager window opens (Figure 3-1), then the Router Connection Options window opens, allowing you to connect to the router. For instructions on how to connect to the router, see *Configuring and Managing Routers with Site Manager.*

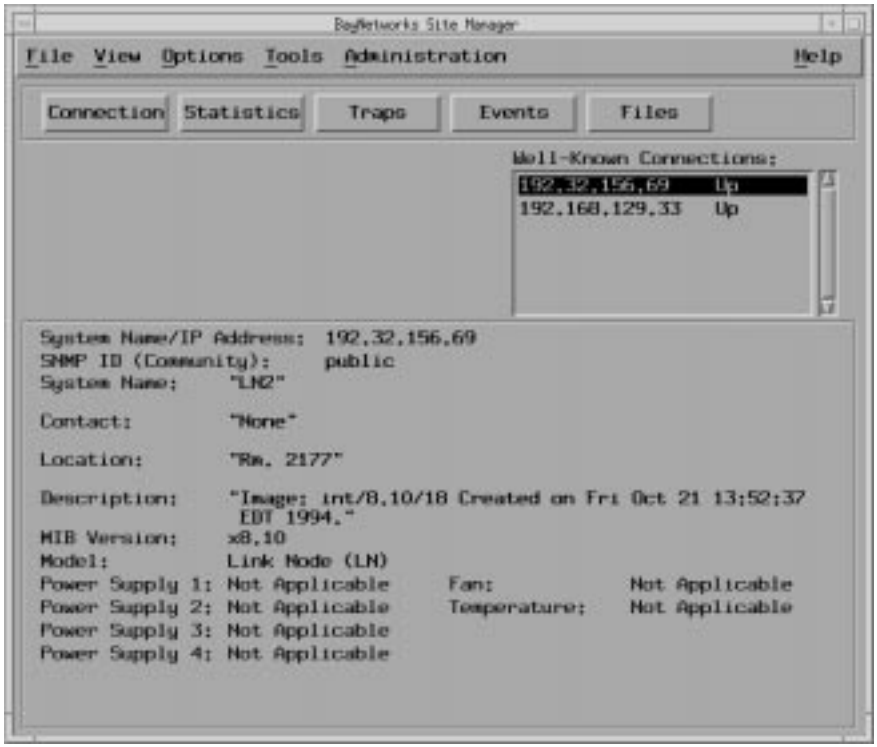
BayNetworks Site Manager
File View Options Tools Administration Help
Connection Statistics Traps Events Files
Well-Known Connections:
192.32.156.69 Up
192.168.129.33 Up
System Name/IP Address: 192.32.156.69
SNMP ID (Community): public
System Name: "LN2"
Contact: "None"
Location: "Rm. 2177"
Description: "Image: int/8.10/18 Created on Fri Oct 21 13:52:37 EDT 1994."
MIB Version: x8.10
Model: Link Node (LN)
Power Supply 1: Not Applicable
Power Supply 2: Not Applicable
Power Supply 3: Not Applicable
Power Supply 4: Not Applicable
Fan: Not Applicable
Temperature: Not Applicable

Figure 3-1. Site Manager Window

After you finish upgrading Site Manager software on your PC, go to "Task 2: Upgrading to BayRS Version 13.xx" on page 3-6.

If you are having problems upgrading Site Manager, see *Troubleshooting Routers*.

Upgrading Site Manager on a UNIX Workstation

To upgrade Site Manager software on a Sun SPARCstation (running SunOS or Solaris), an IBM workstation, or an HP 9000 workstation:

1. **Make sure that your UNIX workstation complies with the Site Manager Version 7.*xx* system requirements listed in Table 2-1 on page 2-2.**

2. **Get superuser privileges.**

   Enter the following command at the UNIX prompt:

   su

3. **Delete the existing Site Manager state files.**

   Site Manager creates state files for all Site Manager tools you use. State files describe the state of the application when you last exited it. You must delete these files before you install the new version of Site Manager on your UNIX workstation or Site Manager may not function properly when you restart it.

Note: Exit from the current version of Site Manager before you delete any Site Manager files. Otherwise, the new version of Site Manager will not overwrite all the existing files.

   To delete the Site Manager state files, enter the following command from the home directory of every user account:

   rm *<home_directory>***/.wf***

4. **Install the Site Manager software.**

   Refer to the appropriate chapter in *Quick-Starting Routers* to install the Version 7.*xx* Site Manager software on a UNIX workstation.

5. **Start Site Manager.**

   Start Site Manager from a directory where you have read/write permission, because this directory becomes the working directory for Site Manager operations. Do not start Site Manager from the */usr/wf* directory.

   To start Site Manager on a UNIX workstation:

   a. **Log in with a user account that has been set up for Site Manager.**

      Be sure that the user account has the correct environment variables set (see *Quick-Starting Routers* for more information).

b. **Start the window environment.**

c. **Change to a directory where you want to store router configuration files.**

d. **Enter the following command:**

```
wfsm &
```

Site Manager starts and the Router Connection Options window opens, allowing you to connect to the router. For instructions on how to connect to the router, see *Configuring and Managing Routers with Site Manager.*

After you finish upgrading Site Manager on your UNIX workstation, go to "Task 2: Upgrading to BayRS Version 13.xx" on page 3-6.

Task 2: Upgrading to BayRS Version 13.*xx*

Bay Networks router software is available on CD only. Table 3-1 lists and describes the files that make up the Version 13.*xx* router software.

Table 3-1. Router Software Files

File Name	Description
config	Default configuration file. The router references this binary file for configuration data when booting. The file must be named *config* for the router to boot with it automatically. Back up the *config* file under a unique name before overwriting it.
bcc.help	Help file for the BCC
debug.al	ASCII file containing aliases
install.bat	Quick-Start installation script file
ti.cfg	Initial configuration file
ti_asn.cfg	Initial configuration file for ASN routers only
ti_arn.cfg	Initial configuration file for ARN routers only
ti_5000.cfg	Initial configuration file for System 5000 routers only
Platform-specific router software image files	Bootable router software image files (*an.exe, arn.exe, asn.exe, bn.exe, s5000.exe*)
Platform-specific diagnostic image files	Diagnostic image files (*frediag.exe, andiag.exe, an200diag.exe, arediag.ppc, asndiag.exe, arndiag.exe, arn_pdbrom.rom, s5000diag.exe*)
Platform-specific boot image files	Boot image files (*anboot.exe, arnboot.exe, areboot.ppc, an200boot.exe, asnboot.exe, freboot.exe, and s5000boot.exe*)

The following sections describe how to load the router software from CD onto your PC or UNIX workstation.

Loading BayRS onto a PC

To load BayRS from CD onto a PC:

1. **Insert the CD into the CD-ROM drive.**
2. **Bring up Windows.**
3. **Choose Start > Programs > Windows Explorer.**

   The Explorer window opens.
4. **In the Explorer window, click on the CD-ROM drive icon (for example, drive D).**
5. **Click on the *rtr_xxxx* directory, where *xxxx* is the router software version.**

   For example, for Version 13.00, click on the *rtr_1300* directory.

   You see a list of directories specific to the version of router software you are using, such as *an*, *asn*, *bn*, and so forth.
6. **Click on the directory for your router platform.**
7. **Copy the router files in the platform directory to a destination folder on your PC.**

   For example, one method you can use to copy the router files to a destination folder is as follows:

   a. **Hold down the [Shift] key and click on each file you want to copy. The files are highlighted.**

   b. **Choose Edit > Copy.**

   c. **Click on the folder to which you want to copy the router files.**

   d. **Choose Edit > Paste.**

      The system copies the router files you selected to the destination folder on your PC. Load router software for any other router platform by repeating steps 6 and 7.

You can now load the router software image from the PC into the Image Builder (see “Task 3: Customizing the Router Software Image” on page 3-9).

Loading BayRS onto a UNIX Workstation

To load BayRS from CD onto a UNIX workstation:

1. **Insert the CD into the CD-ROM drive.**
2. **Log in as root by entering:**

   su
3. **Mount the CD-ROM drive.**

   For mounting instructions, see *BayRS and Site Manager Software Installation.*
4. **Change directories by entering:**

   cd /cdrom
5. **Run the script to load the router software using one of the following commands:**

   - On a SPARCstation or IBM workstation, enter:

     ./copy.sh
   - On an HP 9000 workstation, enter:

     ./COPY.SH\;1

   During the load procedure, you must specify the following:

   - The directory where you want to load the router software, for example, */usr/wf/rtr_1300*
   - The router platform

   The system then loads the software for the platform you selected.

You can now load the router software image from the UNIX workstation into the Image Builder, as described in the next section.

Task 3: Customizing the Router Software Image

A router software image is a group of executable files that contain a version of the router software for a particular type of router. You can customize the router's software image to fit your router configuration requirements using a Site Manager tool called the Image Builder.

Table 3-2 lists router software images by router type.

Table 3-2. Router Software Image Types

Router	Software Image File Name	Device That Image Runs On
AN	*an.exe*	Flash single inline memory modules (SIMMs)
ANH	*an.exe*	Flash card
ARE	*bn.exe*	Flash card
ASN	*asn.exe*	Flash card
BayStack AN and ANH	*an.exe*	Flash SIMM
BayStack ARN	*arn.exe*	Flash SIMM
BCN	*bn.exe*	Flash card
BLN	*bn.exe*	Flash card
IN	*in.exe*	Flash card
System 5000 net modules	*s5000.exe*	Flash card

The image contains all executable files for the current router software. Most executable files have an extension of *.exe*.

Loading the Router Software Image into the Image Builder

To customize the software image, you load it from your PC or UNIX workstation into the Image Builder. When you open the image file using the Image Builder, Site Manager copies the image to an Image Builder directory.

- On a PC, the directory is *\wf \builder.dir*.
- On a UNIX workstation, the directory is defined by the environment variable BUILDER_DIR. You should have defined this variable when you installed Site Manager (see *Quick-Starting Routers* for instructions).

To load the router software image into the Image Builder:

1. **In the Site Manager main window, choose Tools > Image Builder.**

   The Image Builder window opens.

2. **Choose File > Open.**

   The Open window appears (Figure 3-2), listing directories and files.

Figure 3-2. Open Window

3. **Go to the directory where the router software image files reside.**

   For example, go to the directory */usr/wf/rtr_1300.*

4. **Double-click on the directory that contains the router software image you want to load.**

   For example, to load an AN router software image, double-click on the directory */usr/wf/rtr_1300/an.*

5. **Choose the file name of the router software image that you want to open.**

   For example, to upgrade the AN router image, click on the file *an.exe*.

6. **Click on OK.**

   After you choose the directory and file name of the image, the Image Builder window lists the current components of the router software image (Figure 3-3). The components listed vary depending on the version of router software you are using.

Figure 3-3. Image Builder Window with Current Components

7. **Go to "Modifying the Router Software Image" on page 3-12.**

Modifying the Router Software Image

You modify the software image to:

- Remove any nonessential files (protocols) that you will not use.

  You may want to remove specific protocols from the router software image to make more space available on the target flash card (NVFS) volume.

  The Image Builder will not allow you to remove essential files. For example, you cannot remove the Operating System Kernel files from the baseline router software component.

- Add components (protocols) that you removed inadvertently.

To remove a component from the image, select it in the Current Components list of the Image Builder window (Figure 3-3) and click on Remove.

To add a component back to the image, select it in the Available Components list and click on Add.

After you modify the router software image, you must save the image on your workstation or PC. Go to "Saving the Router Software Image."

Saving the Router Software Image

The Image Builder automatically stores a temporary copy of the software image in the Image Builder directory, which is created when you install Site Manager. (See *Quick-Starting Routers* for information about installing Site Manager.) The Image Builder saves only individual components in this directory, which are listed in the Available Components list.

Bay Networks recommends that you save modified software images in a different directory, and that you use different image names for each router on your network.

To save the customized router software image:

1. **In the Image Builder window, choose File > Save.**

   This saves the router software image to your current directory. There is no confirmation window after the image is saved successfully.

2. **Choose File > Exit.**

   You return to the main Site Manager window.

   If you exit the Image Builder without saving your changes, a message asks if you want to discard changes before you exit.

After you finish modifying the image for the router you want to upgrade, back up the current router software image and *config* files for that router as described in Task 4.

Task 4: Backing Up the Router Software Image and Configuration Files

Before completing the upgrade, you should back up onto your PC or workstation the router software image and *config* files currently stored on the router. It is important to maintain backup copies of these files to ensure that you can restore router operation in case you encounter problems during the upgrade process.

For instructions on how to back up the router software image and *config* files onto the hard disk of your Site Manager PC or UNIX workstation, see *Configuring and Managing Routers with Site Manager.*

Chapter 4
Transferring Customized Files to the Router and Upgrading PROMs

This chapter describes how to prepare the router to receive a new software image, how to transfer the customized image and associated router files to the router, and how to upgrade and verify PROMs on the router. See the following topics:

Topic	Page
Task 1: Preparing a Router to Receive a New Software Image	4-1
Task 2: Transferring the Customized Image and Router Files to the Router	4-5
Task 3: Upgrading and Verifying PROMs on the Router	4-9

Task 1: Preparing a Router to Receive a New Software Image

Before you transfer a customized image to the router you want to upgrade, you must first prepare the router's flash card or flash SIMM to receive a customized image and a configuration file. See the following table for further instructions.

If the Number of Flash Memory Cards in the Router Is	Refer to This Section
1	Preparing Routers with One Flash Cards or Preparing Routers Configured for Netboot
Greater than 1	Preparing a Router with Multiple Flash Cards

Preparing Routers with One Flash Card

To prepare a router equipped with one flash card to accept a customized software image:

1. **Verify that you have a backup version of the the router's current boot image on your Site Manager workstation.**

   For instructions on how to back up the current boot image to your Site Manager workstation, see *Configuring and Managing Routers with Site Manager.*

2. **Load all the *.str* files from the router's flash card into router memory.**

   From the Technician Interface, enter the following command:

   string load

   It is important that you load the *.str* files into router memory before deleting the previous router software image. If you fail to load the *.str* files and then delete the previous router software image from the router's flash card, the software image running in memory may need to pull some *.str* files from the image that was previously stored on the flash. However, that image no longer exists or has been partially updated to a new software image.

3. **Delete the current router software image (for example, *an.exe, asn.exe,* or *bn.exe)* from the router's flash card.**

   In the Router Files Manager window, choose Commands > Delete.

   Perform this step if the router is an AN and your network is not configured to perform a Netboot operation on an AN router.

4. **Compact the router's flash card.**

   In the Router Files Manager window, choose Commands > Compact.

   A message appears asking whether you want to proceed with the file compaction.

   Compacting the flash card ensures that it has enough contiguous free space to accommodate the Version 13.*xx* software image.

Note: The AN router may require approximately 12 minutes to finish compacting its flash file space.

5. **Click on Yes in the message window.**

   An hourglass appears for the duration of the file compaction. After several minutes, a window displays the following message, where *x* is the volume you are compacting:

   ```
   Last file system command, "compact x:" finished successfully.
   ```

Go to "Task 2: Transferring the Customized Image and Router Files to the Router" on page 4-5.

Preparing a Router with Multiple Flash Cards

Bay Networks recommends that you use two flash cards in a router that supports multiple flash cards. This allows you to keep the current software image active on one flash card while you use the TFTP command in Site Manager to transfer the new (Version 13.*xx*) image to another flash card designated for the upgrade. After you successfully install and verify the new router software image, you can delete the earlier image version on the other flash card.

To prepare a router equipped with multiple flash cards to receive a customized software image:

1. **Insert a flash card into your router.**

   This flash card is the backup onto which you will store the Version 13.*xx* router software image and associated router files.

2. **Back up the contents of the flash card to the Site Manager workstation.**

   You do this as a safeguard in case the flash card malfunctions.

3. **Reformat the flash card, making sure that the volume or slot number in which the flash card resides is correct.**

   In the Router Files Manager window, choose Commands > Format.

   This operation deletes all files from the flash card and compacts its contents.

   Now your backup flash card is ready to accept the Version 13.*xx* image and associated files.

Go to "Task 2: Transferring the Customized Image and Router Files to the Router" on page 4-5 to copy the router software image to the router.

Preparing Routers Configured for Netboot

If you have an AN or ASN router with one flash card that is configured to boot off the network (using Netboot or Directed Netboot), note the following:

- Do not delete the current boot image from the router's flash card.

  You may need a backup boot image in case the new boot image is corrupted.

- Do not compact the contents of the card.

- Perform a Netboot operation on the AN router using a customized Version 13.*xx* router software image residing on a BootP server in your network.

  In this way, the Version 13.*xx* image runs in active memory on the router, but the current image remains available on the router's flash card as a backup.

After you verify that the Netboot operation completed successfully, you can install the Version 13.*xx* image on the AN flash SIMM, the ASN flash card, or the BayStack router flash card. This ensures that the router software version stored in the router's memory is compatible with the one stored on the AN flash SIMM, ASN flash, or BayStack flash card. After you install the Version 13.*xx* router software image onto the flash SIMM or flash card, you will have a backup version of the 13.*xx* image in case the Netboot operation fails.

Before you install the Version 13.*xx* image on the flash SIMM or flash card:

1. **Delete the current image from the flash SIMM or flash card.**
2. **Compact the contents of the flash SIMM or flash card.**
3. **Use TFTP to transfer your customized Version 13.*xx* image, *an.exe* or *asn.exe*, from your Site Manager workstation to the flash SIMM or flash card volume on the router.**

See *Configuring BayStack Remote Access* or *Connecting ASN Routers to a Network* for detailed instructions on how to perform a Netboot operation on a router.

Task 2: Transferring the Customized Image and Router Files to the Router

You can use the Router Files Manager to transfer a customized software image and associated router files to the router you want to upgrade using the Trivial File Transfer Protocol (TFTP) command. For a list of the files you need to transfer to the router, see "Task 2: Upgrading to BayRS Version 13.xx" on page 3-6.

To transfer a customized image file from the Site Manager PC or workstation to the router you want to upgrade:

1. **Copy the router files from the directory in which you loaded the router software (for example, *<u>/usr/wf/rtr_13.00/an</u>*).**
2. **In the main Site Manager window, choose the router to which you want to transfer the software image by clicking on its IP address in the Well-Known Connections list.**
3. **Choose Tools > Router Files Manager.**

   The Router Files Manager window opens (Figure 4-1).

Router Files Manager
File Options Commands Help
System Name: 192.168.125.34
Volume: 2:
install.bat 204237 Jul 07, 1997 15:56
ti.cfg 132 Jul 07, 1997 16:03
bn.exe 4075509 Jul 16, 1997 10:08
startup.cfg 1556 Jul 17, 1997 12:56
config 4112 Jan 06, 1997 14:12
bcc.help 165060 Aug 05, 1997 12:22
Total size: 8388608
Available free space: 3036864
Contiguous free space: 2861293

Figure 4-1. Router Files Manager Window

4. **Verify space on the destination volume.**

   Make sure that the router destination volume has enough space available for the files you want to transfer. The Router Files Manager window shows the available free space and contiguous free space on the router.

   If necessary, compact the memory card to optimize the available free space, as follows:

   a. **In the Router Files Manager window, choose Commands > Compact.**

   b. **Click on OK in the Confirmation window.**

5. **Choose File > TFTP > Put File(s).**

   The TFTP Put File Selection window opens (Figure 4-2).

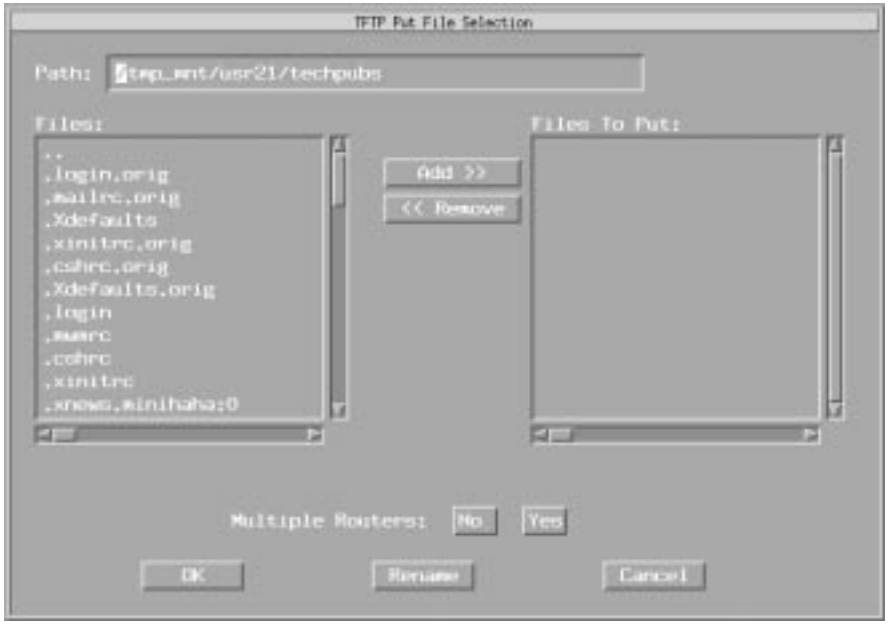

Figure 4-2. TFTP Put File Selection Window

6. **In the Path field, enter the path to the directory on the Site Manager workstation that contains the image file you want to transfer.**

   The file names in that directory appear in the Files list. You may transfer more than one file at a time, if applicable.

7. **In the Files list, click on the image file and the associated router files that you want to transfer to the router.**

8. **Click on Add.**

   The selected files appear in the Files To Put list.

   If you inadvertently add a file that you do not want to transfer to the router, choose that file in the Files To Put window and click on Remove.

9. **If you want to send the image file and associated router files to only one router, click on No in the Multiple Routers field. Click on Yes to send these files to multiple routers.**

   For more information about transferring files to multiple routers, see *Configuring and Managing Routers with Site Manager.*

10. **Click on OK.**

    The Router Files Manager transfers the files to the router. If a file of the same name already exists in that directory, the transferred file overwrites it.

    If the file transfer fails, check your setup for the TFTP operation. Then try to transfer the file again.

    If you need assistance, call the Bay Networks Technical Solutions Center.

Caution: If you cannot transfer the customized image to the router successfully, do not reboot the router. On single flash card systems, the router fails to boot because there is no image available from which it can boot.

Next, you must update the PROMs on the router and boot the router to load the new Version 13.*xx* software image. Go to "Task 3: Upgrading and Verifying PROMs on the Router."

Task 3: Upgrading and Verifying PROMs on the Router

The router's programmable read-only memory (PROM) contains software images for its bootstrap and diagnostic code. Bootstrap and diagnostic PROM code is included on the BayRS Version 13.*xx* release media.

Bay Networks strongly recommends that you upgrade PROMs in a router to implement the latest software or hardware features.

Methods for Upgrading PROMs

Depending on the type of router you are upgrading, you upgrade PROMs in the following ways:

- By reprogramming the PROM components using the Technician Interface. This process of erasing the contents of the PROM and transferring new bootstrap and diagnostic images is sometimes called "burning" the PROM.
- By physically replacing the existing PROM with a new PROM version that is compatible with the current router software version.

Table 4-1 summarizes the methods for upgrading PROMs by router type.

Table 4-1. Methods for Upgrading Boot PROMs in Various Routers

If Router Model Is	PROM Replacement Method Is	Refer to
AN or ANH with motherboard revision level earlier than 14	Physical replacement	*Installing Boot and Diagnostic PROMs in an AN Router*
AN, ANH, or BayStack routers with motherboard Revision 14 or later	Technician Interface **prom** command	*Installing Boot and Diagnostic PROMs in an AN Router*
ASN or BN (BLN, BLN-2, BCN, ARE)	Technician Interface **prom** command	"Upgrading and Verifying PROMs" in this chapter

Depending on your AN or ANH model, you transfer new boot and diagnostic code to PROM using either:

- A PCMCIA flash card (BayStack AN and ANH)
- SIMM-based flash memory (AN and ANH models without a PCMCIA slot)

To upgrade the PROMs in a SIMM-based AN router with a motherboard revision level earlier than 14, you must order a PROM Upgrade Kit (Order No. 109435) to physically replace the PROM components.

Go to "Upgrading and Verifying PROMs."

Upgrading and Verifying PROMs

You use the **prom** command from the Technician Interface to upgrade and verify the software on the diagnostic or boot PROM. This command is restricted to the Manager access level.

When you upgrade PROMs, the system erases the existing PROM image and copies the contents of the newer PROM image file to the PROM. To verify the PROM, the system compares the contents of the new image file to the actual contents of the PROM. See Table A-1 on page A-2 for Version 13.00 boot and diagnostic PROM file names and associated revision numbers for all router platforms.

Note: Before upgrading any router software, make sure that you save a copy of the original configuration file and boot image as a safeguard in case you encounter problems after upgrading.

To upgrade and verify PROMs on a router, begin at the Technician Interface prompt and complete the following steps:

1. **Establish a Technician Interface session with the router.**

   Enter the following command at the Technician Interface prompt:

   Manager

   For more information about how to open a Technician Interface session with the router, see *Using Technician Interface Software*.

2. **Insert a flash card with contiguous free space sufficient to accommodate the PROM images you want to upgrade on the router.**

   To determine the amount of contiguous free space, display the directory of the flash volume by entering the following command at the Technician Interface prompt:

   dir <*volume_no.*>**:**

   volume_no. is the slot in which the flash card resides.

If you need more contiguous free space for the PROM image:

a. **Delete unnecessary or obsolete files.**

b. **Compact the contents of the flash card by entering:**

compact *<volume_no.>***:**

The following message appears:

```
Compacting file system on volume <vol>:...
This may take several minutes...Please wait...
100% Complete
Compaction completed
```

The space is compacted when the Technician Interface prompt reappears.

c. **Verify that the amount of contiguous free space and available free space on the volume are the same by entering:**

dir *<volume_no.>***:**

3. **Transfer the PROM image files (for example, *freboot.exe* and *frediag.exe*) to the router's flash card by using the tftp command.**

For more information about the **tftp** command, see *Using Technician Interface Software*.

4. **Update the boot PROM by entering:**

prom -w *<volume_no.>***:***<Boot_PROM_source_file> <slot_ID>*

volume_no. is the slot number of the boot PROM source file.

Boot_PROM_source_file is the name of the boot PROM source file (for example, *freboot.exe*).

slot_ID is the slot location of the boot PROM that you want to update.

For AN, ANH, and ARN routers, the *slot_ID* is always 1.

For example, enter the following command:

prom -w 2:freboot.exe 3

This command erases the boot PROM image on slot 3 and copies the contents of the *freboot.exe* file on volume 2 to the PROM on slot 3.

Note: After you enter the **prom** command, it must run to completion. The [Control]-c (abort) command is disabled for the duration of the **prom** command execution. Updating takes from 2 to 10 minutes per PROM. Verifying takes up to 2 minutes per PROM.

5. **Update the diagnostic PROM by entering:**

   prom -w *<volume_no.>*:*<Diag_PROM_source_file> <slot_ID>*

   volume_no. is the slot number of the diagnostic PROM source file.

   Diag_PROM_source_file is the name of the diagnostic PROM source file (for example, *frediag.exe*).

   slot_ID is the slot location of the diagnostic PROM file you want to update.

   For AN, ANH, and ARN routers, the *slot_ID* is always 1.

   For example, enter the following command:

   prom -w 2:frediag.exe 3

   This command erases the diagnostic PROM image on slot 3 and copies the contents of the *frediag.exe* file on volume 2 to the PROM on slot 3.

6. **Upgrade PROMs on multiple slots on your router.**

   If you need to update PROM images on multiple slots, use a dash to indicate a range of slots (2-5), or use commas or spaces to separate multiple slot locations (2, 3, 4, or 2 3 4).

   For example, enter the following command:

   prom -w 2:frediag.exe 2, 3, 4, 5

   This command erases the diagnostic PROM images on slots 2, 3, 4, and 5 and copies the contents of the *frediag.exe* file on volume 2 to the PROMs on slots 2, 3, 4, and 5.

   For more information about updating PROMs on multiple slots, see *Using Technician Interface Software*.

7. **Verify the PROM upgrade by entering the following command:**

   prom -v *<volume_no.>*:*<Diag_PROM_source_file> <slot_ID>*

For example, for a boot PROM, enter:

prom -v *<volume_no.>*:**[freboot.exe | asnboot.exe | anboot.exe | arnboot.exe]** *<slot_ID>*

For a diagnostic PROM, enter:

prom -v *<volume_no.>*:**[frediag.exe | asndiag.exe | andiag.exe | arndiag.exe]** *<slot_ID>*

The system verifies that the PROM image on a designated flash volume (that is, the image file used as a source for upgrading the PROM) matches the image actually stored in the boot or diagnostic PROM on the designated slot.

The console displays one of the following messages after the verification terminates:

```
prom: slot <slot ID> completed successfully
prom: PROM data does not match file data on slot <slot ID>
```

If the operation succeeds, the new images stored in the boot and diagnostic PROMs run when you reboot the router.

If the operation fails, the console displays a message describing the cause of the failure.

Upgrading PROMs in a Router from a Remote Site

This section summarizes the procedure for upgrading PROMs in a router that is located at a remote site. Be sure to read the special considerations in this section before upgrading router PROMs remotely.

Caution: If the PROM upgrade process is interrupted, the router could be disabled.

When upgrading PROMs in a router from a remote site, follow these guidelines to ensure that the PROM upgrade is successful:

- Store the PROM executable files (for example, *frediag.exe* and *freboot.exe*) on a flash card that resides on the router slot that you use the least.
- Perform the upgrade during off-peak hours to ensure a minimum traffic load across all rails of the backplane (PPX®).

The operations involved in updating PROMs are both data-transfer and CPU intensive. Because periods of high traffic (peak periods) may cause timeouts or other failures of the PROM upgrade process, it is important to perform PROM upgrades during off-peak periods. A failure during a PROM upgrade makes it necessary to repeat the procedure.

- On multislot systems, upgrade the PROM for each slot separately. Attempting to upgrade multiple slots at the same time increases the load on the router backplane.

Caution: Never reset or reboot a router while upgrading PROMs. Should a failure occur, restart the procedure immediately.

After you upgrade PROMs on the router, boot the router with the customized image and upgrade your existing configuration file to support the new Version 13.*xx* features. Go to Chapter 5.

Chapter 5
Booting the Router with the Customized Image and Upgrading the Configuration

This chapter describes how to boot the router with the customized image and upgrade the existing configuration file to support new BayRS Version 13.*xx* features. It also describes how to transfer Technician Interface script files to the router. See the following topics:

Topic	Page
Task 1: Booting the Router with the Customized Image	5-1
Task 2: Updating the Existing Configuration File	5-3
Task 3: Transferring Script Files to the Router	5-6

Task 1: Booting the Router with the Customized Image

To boot the router with the customized image:

1. **In the Site Manager window, choose Administration > Boot Router.**

   The Boot Router window opens (Figure 5-1), showing the default router volume for the router boot image file (*bn.exe*) and the default configuration file name (*config*). The file names and volumes vary depending on the router.

   The default volume is the first available card or module, which is designated by its slot number.

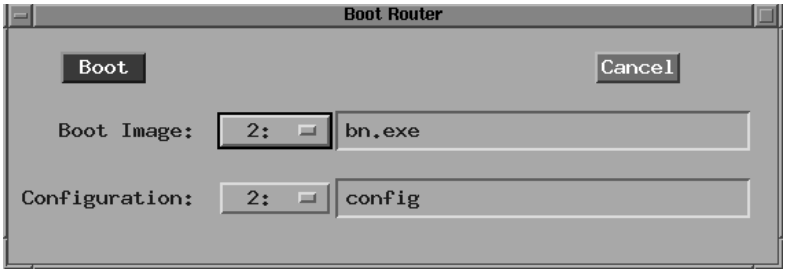

Figure 5-1. Boot Router Window

2. **Choose the router volume for the boot image.**

Note: If the router you want to upgrade has only one flash card, do not change the volume displayed.

   a. **Click on the small button next to Boot Image (Figure 5-1).**

      A menu displays all the available router volumes containing the router software image.

   b. **Choose the volume with the boot image that you want to use.**

3. **Verify the name of the new router software boot image.**

   The default router-specific image name appears in the Boot Image box.

Note: If you are upgrading a router that is running Version 11-12.*xx* boot PROMs to Version 13.*xx*, and that router contains multiple flash cards, remove the Version 11-12.*xx* backup flash card from the router. Otherwise, when you reset or cold-start the router, it will run different software versions on different slots.

4. **Verify the configuration file from which you want to boot the router.**

   The default configuration file name *config* appears in the Configuration box.

5. **Click on Boot.**

   A confirmation window appears.

6. **Click on OK.**

   The router boots using the router software image and the configuration file you specified.

   Wait a few minutes for the router to boot. The boot time may be longer if you are booting an ASN router for the first time from a Version 13.*xx* image.

7. **Verify that the router booted successfully with the customized image and configuration file.**

   In the main Site Manager window, choose View > Refresh Display.

   If the router booted successfully, Site Manager establishes a connection to the router and displays system information (such as the system name, contact, location, description, and MIB version).

   If Site Manager does not display system information, the router did not boot successfully. Consider the following:

   - If you have a router with one flash card, use a local console to reboot the router from the Technician Interface. If this operation fails, call the Bay Networks Technical Solutions Center in your area.
   - If your router has multiple flash cards, boot the router from the original flash card (pre-Version 13.*xx*).

Task 2: Updating the Existing Configuration File

This section describes how to upgrade your existing configuration files to support the new Version 13.*xx* features. Optionally, you can create a new Version 13.*xx* configuration file to replace your existing configuration file for the router.

Booting the Existing Configuration File

To upgrade an existing configuration file to Version 13.*xx*, boot it on a router running a Version 13.*xx* router software image. The router software loads the existing configuration file into router memory and updates the configuration file's version stamp to match the Version 13.*xx* router software. It does not, however, automatically save that version to the file on the flash card until you save the configuration file in dynamic mode.

Saving the Configuration File in Dynamic Mode

After you boot the router with a Version 13.*xx* image and the existing configuration file, save the configuration file in dynamic mode to save it directly to the router.

To save the existing configuration file in dynamic mode:

1. **In the Site Manager window, choose Tools > Configuration Manager > Dynamic.**

   The Configuration Manager window opens (Figure 5-2), displaying the real-time router hardware and software configuration.

Figure 5-2. Configuration Manager Window

2. **Choose File > Save As.**

   The Save Configuration File window opens (Figure 5-3).

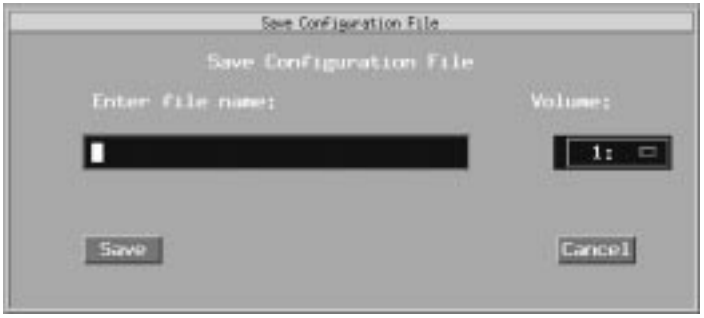

Figure 5-3. Save Configuration File Window

3. **Enter the configuration file name *config*.**
4. **Choose the correct volume by clicking in the Volume field.**

   If the volume (slot location of the memory card on the router) is not the volume to which you want to save this file, choose another volume.
5. **Click on Save.**

   The File Saved window opens (Figure 5-4), asking you to confirm your decision to save the file.

Figure 5-4. File Saved Window

6. **Click on OK.**

   This action saves the configuration file, *config*, to the router's flash card with the Version 13.*xx* version stamp.

Task 3: Transferring Script Files to the Router

Transfer to the router from your Site Manager PC or UNIX workstation any Version 13.*xx* Technician Interface scripts useful for your router configuration. These scripts let you manage the router using information stored in the MIB. You can use the scripts to display information about protocols and network services and to enable and disable protocols, circuits, lines, and services.

Technician Interface Script Descriptions

The Technician Interface scripts are *.bat* and *.mnu* files; transfer these files to a memory card in each router that you are upgrading to Version 13.*xx*.

- The *.bat* files enable you to generate information about a protocol or service that the router supports.
- The *.mnu* files enable you to display this information from menus.

Each script contains subcommands to support the options that it provides. For a complete list of script files and definitions, see *Using Technician Interface Scripts*.

For each router that you want to upgrade to Version 13.*xx*, you must transfer a minimum set of scripts (Table 5-1).

Table 5-1. Minimum Set of Scripts to Transfer to a Router

Script File Name	Description
show.bat	Helps you isolate problems such as circuits that are not working, packets that are not being forwarded, and so forth.
setpath.bat	Sets the search path and aliases for the script commands.
menu.bat	Provides a menu from which you can select the script you want to run.
main.mnu	Displays a top-level menu from which you can select other *.bat* files currently on the system.
monitor.bat	Displays the same information as the **show** command, but refreshes the display periodically so that you can examine trends and changes.

In addition to the required script files listed in Table 5-1, you can transfer to your router any protocol-specific scripts to support the protocols on the router that you are upgrading to Version 13.*xx*. For example, if you want to run only IP and frame relay on a router, transfer to that router the following script files*: ip.mnu, fr.bat,* and *fr.mnu*.

Appendix A
PROM Upgrade Considerations

This appendix describes why you need to upgrade boot and diagnostic PROMs and how to determine the current version of boot and diagnostic PROM images currently running in your router. It also describes boot PROM upgrades for new feature support.

On the back panel of some routers, a label displays the installed version of boot and diagnostic PROMs. For example, an AN router with a SIMM-based flash file system has a label that indicates the current PROM version number. See the guide contained in the PROM upgrade kit (*Installing Boot and Diagnostic PROMs in an AN Router*) for more information.

Why You Upgrade Boot and Diagnostic PROMs

You upgrade boot PROMs in a router when you want to install new software or hardware in the router that depends on the availability of the new router software boot PROM image. For example, if you want to implement flash partitioning for your AN router, you must upgrade the boot PROM image, *anboot.exe*, in that router.

You upgrade diagnostic PROMs in routers when the diagnostic image version number for the new release of router software is higher than the diagnostic image version number for the router software currently installed on your router.

Table A-1 lists the current boot and diagnostic PROM file names and associated revision numbers for router platforms running BayRS.

Table A-1. Version 13.00 Boot and Diagnostic PROM Revisions

Router Platform	Diagnostic PROM File Name	Diagnostic PROM Revision Number	Reason for Upgrading PROM	Boot PROM File Name	Boot PROM Revision Number
AN/ANH	*andiag.exe*	v7.34	Strata flash feature support	*anboot.exe*	9.00d
AN200	*an200diag.exe*	v1.00	Strata flash feature support	*an200boot.exe*	11.01
ARN	*arndiag.exe*	v2.16	Strata flash feature support	*arnboot.exe*	1.22
ARN_PDBROM.ROM	*arn_pdbrom.rom*	v1.06	Not applicable	Not applicable	Not applicable
ASN	*asndiag.exe*	v2.30	Strata flash feature support	*asnboot.exe*	13.00
BN	*frediag.exe*	v5.14	Strata flash feature support	*freboot.exe*	13.00
ARE (BN, 5782 MPE)	*arediag.ppc*	v1.16	Strata flash feature support	*areboot.ppc*	13.00
System 5000 net modules	*s5000diag.exe*	v0.04	Strata flash feature support	*s5000boot.exe*	13.00

Using Site Manager to Determine the PROM Version

To obtain PROM version information from any router currently connected to your Site Manager PC or UNIX workstation:

1. **In the main Site Manager window, choose Tools > Statistics Manager.**

   The Statistics Manager window opens.

   The Statistics Manager displays the current router's configuration, that is, the circuit type and location of the router's network interfaces and the bridging and routing protocols that are enabled on each interface.

2. **Choose Tools > Quick Get.**

   The Quick Get Facility window opens, showing the objects in the MIB. Use the browser window to scroll through and select objects from the MIB. Then use Quick Get to get all instances of the objects you select and to display that information in columns in the Quick Get Facility window.

3. **Scroll through the MIB Browser window and choose the top-level object group wfHardwareConfig.**

   The MIB displays subordinate object groups pertaining to router hardware configuration.

4. **Click on the object group wfHwTable.**

5. **Continue choosing object groups and descending through the tree until the MIB Browser displays the object wfHwBootPromRev or wfHwDiagPromRev (depending on which PROM version you want to verify).**

6. **Select the object wfHwBootPromRev or wfHwDiagPromRev.**

   The Object Information field at the top right of the Quick Get window displays information about the object.

7. **In the Quick Get window, click on Retrieve Request.**

   All router slots (indicated by the Instance ID field in the Quick Get data retrieval window) and the boot or diagnostic PROM version associated with each slot appear.

   The format for the boot or diagnostic PROM revision that appears in the output window is eight hexadecimal numerals in a 32-bit display. The first four characters are major revisions; the last four are minor revisions.

   Convert the hexadecimal numerals to decimal to determine the PROM revision level. For example, the PROM image version number returned for the Version 13.*xx* router software is 0x000130000.

Note: Slots that have a System Resource Module (SRM) do not show a corresponding boot PROM revision number.

8. **Click on Done to exit the Quick Get Facility window.**

   For more information about using Quick Get, see *Configuring and Managing Routers with Site Manager.*

Using the Technician Interface to Determine the PROM Version

To determine the version number of PROM images residing in a router while working from a local console, a Telnet session, or a modem, use the Technician Interface.

1. **To obtain the version number of boot PROM images residing in a router, enter:**

   get wfHwEntry.19.*

With a BLN router, for example, information similar to the following appears, with one `wfHwEntry.wfHwBootPromSource` line for each slot:

```
wfHwEntry.wfHwBootPromSource.1 = (nil)
wfHwEntry.wfHwBootPromSource.2 = "rel/13.00/freboot.exe"
wfHwEntry.wfHwBootPromSource.3 = "rel/13.00/freboot.exe"
wfHwEntry.wfHwBootPromSource.4 = "rel/13.00/freboot.exe"
wfHwEntry.wfHwBootPromSource.5 = "rel/13.00/freboot.exe"
```

Each line of output specifies:

- A slot number (for example, "`wfHwEntry.wfHwBootPromSource.2`" identifies slot 2).
- A path name that contains the version number of the image stored in the boot PROM (for example, "`rel/13.00/freboot.exe`" identifies the Version 13.00 boot PROM image *freboot.exe*).

Note: The command does not return a boot PROM version number for slot 1, because slot 1 contains a System Resource Module (SRM). This applies to all routers except AN and ASN routers.

2. **To obtain the version number of diagnostic PROM images residing in a router, enter:**

   get wfHwEntry.16.*

With a BLN router, for example, information similar to the following appears, with one `wfHwEntry.wfHwDiagPromSource` line for each slot:

```
wfHwEntry.wfHwDiagPromSource.2 =
"/harpdiag.rel/v7.00/wf.pj/harpoon.ss/image.p/frediag.exe"
wfHwEntry.wfHwDiagPromSource.3 =
"/harpdiag.rel/v7.00/wf.pj/harpoon.ss/image.p/frediag.exe"
wfHwEntry.wfHwDiagPromSource.4 =
"/harpdiag.rel/v7.00/wf.pj/harpoon.ss/image.p/frediag.exe"
wfHwEntry.wfHwDiagPromSource.5 =
"/harpdiag.rel/v7.00/wf.pj/harpoon.ss/image.p/frediag.exe"
```

Each line of output specifies:

- A slot number (for example, "`wfHwEntry.wfHwDiagPromSource.2`" identifies slot 2).
- A path name that contains the version number of the image stored in a diagnostic PROM (for example, "`/harpdiag.rel/v7.00/wf.pj/harpoon.ss/image.p/frediag.exe`" identifies the Version 7.00 diagnostic PROM image *frediag.exe*).

  See *Using Technician Interface Software* for more information.

If you determine that you need to upgrade PROMs in your router, see "Upgrading and Verifying PROMs" on page 4-10.

Appendix B
Upgrading the DCM Software Image in BayStack Routers

This appendix describes how to upgrade the DCM software image in BayStack routers (AN, ANH, or ARN) using Site Manager and the Technician Interface.

Topic	Page
Verifying Hardware and Software Requirements	B-1
Verifying Minimum DCM Requirements	B-2
Upgrading the DCM Software Image	B-3

Verifying Hardware and Software Requirements

To use RMON and RMON2 on a BayStack router running BayRS Version 13.*xx*, the router must also run DCM Agent Software Version 2.00.1. Enabling an Ethernet DCM with DCM agent software earlier than Version 2.00.1 generates a warning log message, which prevents the Ethernet DCM from booting successfully.

Table B-1 lists the software and hardware requirements for RMON and RMON2 operation on BayStack AN/ANH routers.

Table B-1. AN/ANH Requirements for Using RMON and RMON2

Software/Hardware	Recommended Version
DCM hardware	Revision E
Boot PROM	Version 9.00d (*anboot.exe* v9.00d) or later
Diagnostic PROM	Version v7.34 (*andiag.exe* v7.34) or later
BayRS	BayRS Version 13.00 (*an.exe* v13.00) or later
DCM agent software	DCM Agent Software Version 2.00.1 (*in_2.00.1.obj*)

Table B-2 lists the software and hardware requirements for RMON and RMON2 operation on BayStack ARN routers.

Table B-2. ARN Requirements for Using RMON and RMON2

Software/Hardware	Recommended Version
DCM hardware	Revision E
Boot PROM	Version 1.22 (*arnboot.exe* v1.22) or later
Diagnostic PROM	Version 2.00 (*arndiag.exe* v2.00) or later
BayRS	Version 13.00 (*arn.exe* v13.00) or later
DCM agent software	Version 2.00.1 (*in_2.00.1.obj*)

Verifying Minimum DCM Requirements

To verify the minimum DCM hardware and software requirements:

1. **Establish a Technician Interface session on the router.**
2. **Verify the correct DCM hardware revision by entering the following command:**

   [1:TN]$ get wfDCMEntry.wfDCMhwRev.*

   The Technician Interface displays information similar to the following:

```
wfDCMEntry.wfDCMhwRev.1 = "E"
wfDCMEntry.wfDCMhwRev.2 = "E"
```

If the Hardware Revision line indicates “C” or earlier, you must upgrade to DCM Hardware Revision E.

3. **Display the current version of DCM agent software by entering the following command:**

   [1:1]$ get wfDCMEntry.wfDCMagentImageVersion.*

   The Technician Interface displays information similar to the following:

   ```
   wfDCMmw.wfDCMagentImageVersion.1 = "V1.4.2"
   ```

   (There are two entries if there are two DCMs installed on an ARN router.)

   If the Agent Image Version line does not indicate “V1.4.1” or “V1.4.2,” go to the next section to upgrade the DCM agent software.

Upgrading the DCM Software Image

Upgrading the DCM software image in BayStack routers involves the following tasks:

- Transferring the DCM software image from CD to your PC or UNIX workstation
- Transferring the DCM software image from your PC or UNIX workstation to the router’s flash memory card
- Transferring the DCM software image from the router’s flash memory to the DCM’s flash memory

Using Site Manager

To upgrade the DCM software image in a BayStack router using Site Manager:

1. **Transfer the DCM software image (for example, *in_2.00.1.obj*) to a PC or UNIX workstation from:**

   - The latest BayRS CD release media
   - The World Wide Web URL:

     http://support.baynetworks.com/software/Router/

   Contact the Bay Networks Technical Solutions Center if you do not have access to these sources.

2. **Transfer the DCM software image from your PC or workstation to the router's flash memory.**

   Use the Site Manager Router Files Manager utility.

3. **Transfer the DCM software image from the router's flash memory to the DCM flash memory, as follows:**

   In the Configuration Manager window (Figure B-1), choose Platform > DCM 11.0 and later > Global > Base Module DCM (or Expansion Module DCM).

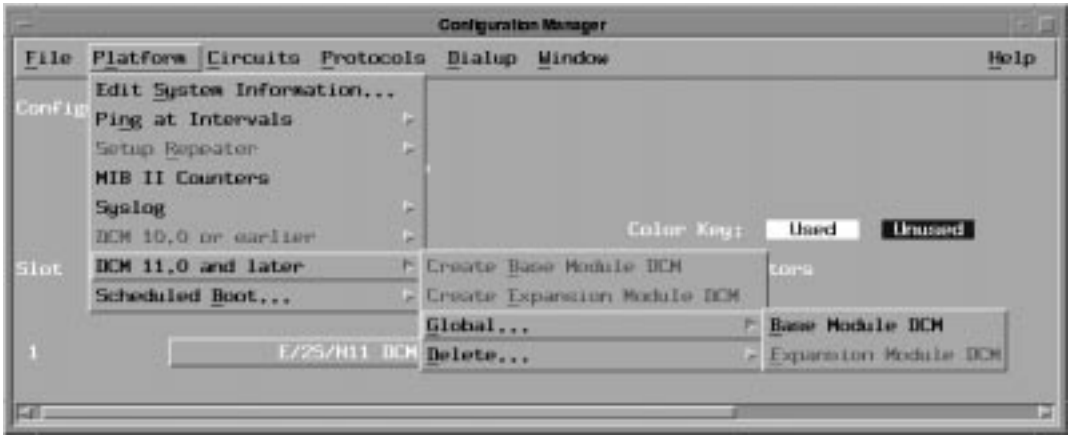

Figure B-1. Choosing DCMMW Global Configuration Parameters

The Edit Base Module DCM Parameters window opens (Figure B-2).

Figure B-2. Edit Base Module DCM Parameters Window

4. **Set the Enable/Disable parameter to Disable.**
5. **Change the Boot Option from Local to Download.**

   This setting specifies that you want the Ethernet DCM to boot the downloaded DCM image from the router's shared memory instead of from the Ethernet DCM's flash memory.
6. **In the Image Name field, specify the target volume and the file name of the new DCM software image (*in_2.00.1.obj*) on the router, for example:**

   1:in_2.00.1.obj
7. **Set the Image Save Mode parameter to Save and click on OK.**

   You return to the Configuration Manager window.

If you set the Image Save Mode parameter to No Save, the Ethernet DCM boots with the new software image but does not save the image to the Ethernet DCM's flash memory.

8. **In the Configuration Manager window (Figure B-1), choose Platform > DCM 11.0 and later > Global > Base Module DCM (or Expansion Module DCM).**

   The Edit Base Module DCM Parameters window opens (Figure B-2).

9. **Set the Enable/Disable parameter to Enable and click on OK.**

   This action boots the Ethernet DCM with the new DCM software image that you specified using the Image Name parameter and saves the new DCM software image to flash memory, if specified.

10. **Set the Boot Option parameter to Local.**

    Choose the Local option after you save the DCM software image to the Ethernet DCM's flash memory to boot the Ethernet DCM from its own flash memory.

11. **Click on OK.**

Using the Technician Interface

To upgrade the DCM software image in a BayStack router using the Technician Interface:

1. **Transfer the DCM software image (for example, *in_2.00.1.obj*) to a PC or UNIX workstation from:**

   - The latest BayRS CD release media
   - The World Wide Web URL:

     http://support.baynetworks.com/software/Router

   Contact the Bay Networks Technical Solutions Center if you do not have access to these sources.

2. **Use FTP or TFTP to transfer the DCM image file and the Technician Interface script *dcmload.bat* from the workstation to the flash memory card on the router.**

3. **Enter the following Technician Interface command to download the new software image from the router flash memory card to the DCM flash memory:**

   `[1:1]$` **dcmload**

   The Technician Interface displays information about the **dcmload** script and displays the following prompt:

   ```
   Do you want to download an image to the Base Module DCM
   or the Expansion Module DCM (b/e) [b]
   ```

4. **If the DCM is installed on the base module, press Return. If the DCM is installed on an ARN expansion module, enter e.**

   The Technician Interface displays the following prompt:

   ```
   Specify DCM image name (volume:filename):
   ```

5. **Enter the image name in the form** *<volume:filename>.*

   volume is 1 and *filename* is the name you gave the DCM image during the file transfer.

   For example, enter:

   1:in_2.00.1.obj or **1:dcm201image**

   The Technician Interface displays the following prompt:

   ```
   Do you want DCM to save this image on its FLASH? (y/n) [y]
   ```

6. **Answer yes by pressing [Return].**

   If you answer no, the DCM uses the downloaded image only once, reverting to the previous image at the next boot. The Technician Interface displays the following prompt:

   ```
   Do you want to start the download process? (y/n)[y]
   ```

7. **Answer yes to begin downloading the new image, overwriting the existing DCM software image.**

   The downloading process takes less than 1 minute.

8. **Verify that the DCM software image is now Version 2.00.1.**

   See step 3 in the section "Verifying Minimum DCM Requirements" on page B-2.

Sample Display: dcmload.bat

```
Use this script to download a DCM image from the router's
Flash to a DCM board.

When prompted for the image file name, use the form
<volume:filename>.

When prompted whether to save the image on the DCM Flash,
answer yes (y) to overwrite the existing image on the DCM
Flash with the new image. Answer no (n) to use the downloaded
image once, but lose it at the next boot.

Specify DCM image name (volume:filename): 1:in_2.00.1.obj

Do you want DCM to save this image on its FLASH? (y/n) [y]: y

Image Name is 1:dcmboot.exe
Image will be saved by DCM in its FLASH

Do you want to start the download process? (y/n) [y]: y
Downloading of DCM image has started. It will take few seconds to
complete.
```

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